Status of the Ocean-Colour Algorithm working Group

ZPL on behalf the OCAG

January 15 – 17, 2004. Hyderabad, India.

Outline:

1. The synthesized dataset

2. Preliminary results of some inversion algorithms

3. Next

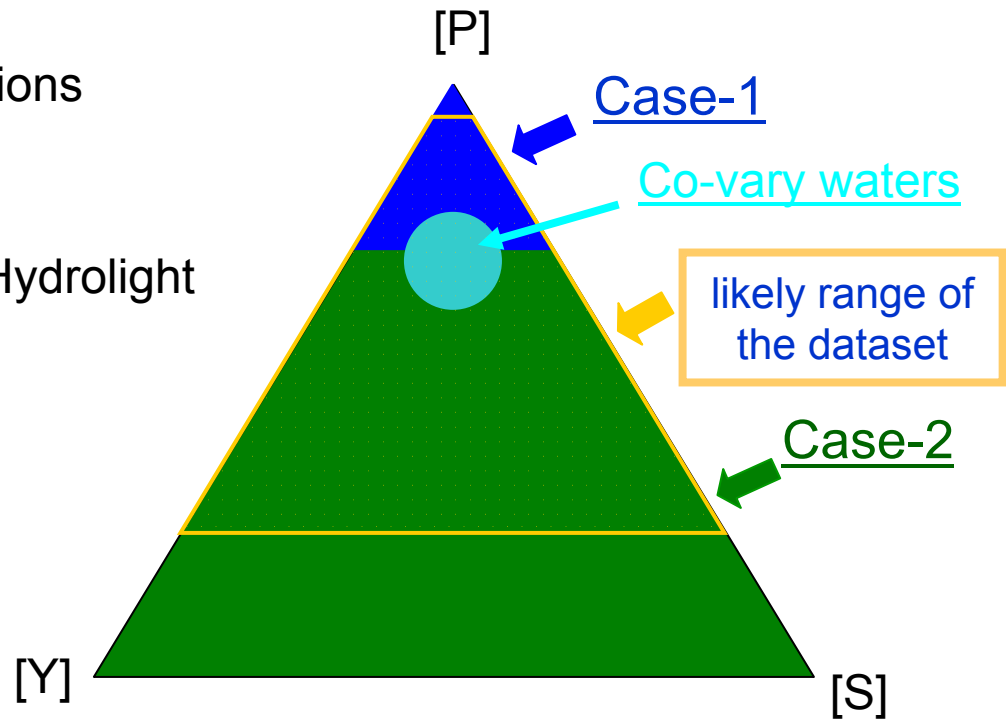
1. Some characteristics of the synthesized dataset

a. It includes Case-1 and Non-Case-1

b. Closely follow natural variations

c. Wide dynamic range

d. AOPs are simulated using Hydrolight



1. Some characteristics of the synthesized IOPs

Generally,

$$a(\lambda) = a_{\mathrm{w}}(\lambda) + a_{ph}(\lambda) + a_{dm}(\lambda) + a_{\mathrm{g}}(\lambda)$$

$$bb(\lambda) = bb_{\mathrm{w}}(\lambda) + bb_{\mathrm{ph}}(\lambda) + bb_{dm}(\lambda)$$

Four-components to model a.
Three-components to model *bb*.
Independent phase functions for water, phytoplankton, and detritus/mineral scatterings.

All components vary independently, but in a range selected by the group.

So, for a low a_{ph}, no extremly large a_{g} or a_{dm}. Or, for a large a_{ph}, no extremely low a_{g} or a_{dm}.

1. Characteristics continue:

$$a_{ph}(\lambda) = a_{ph}(440)\,\boxed{a^{+}_{ph}(\lambda)}$$

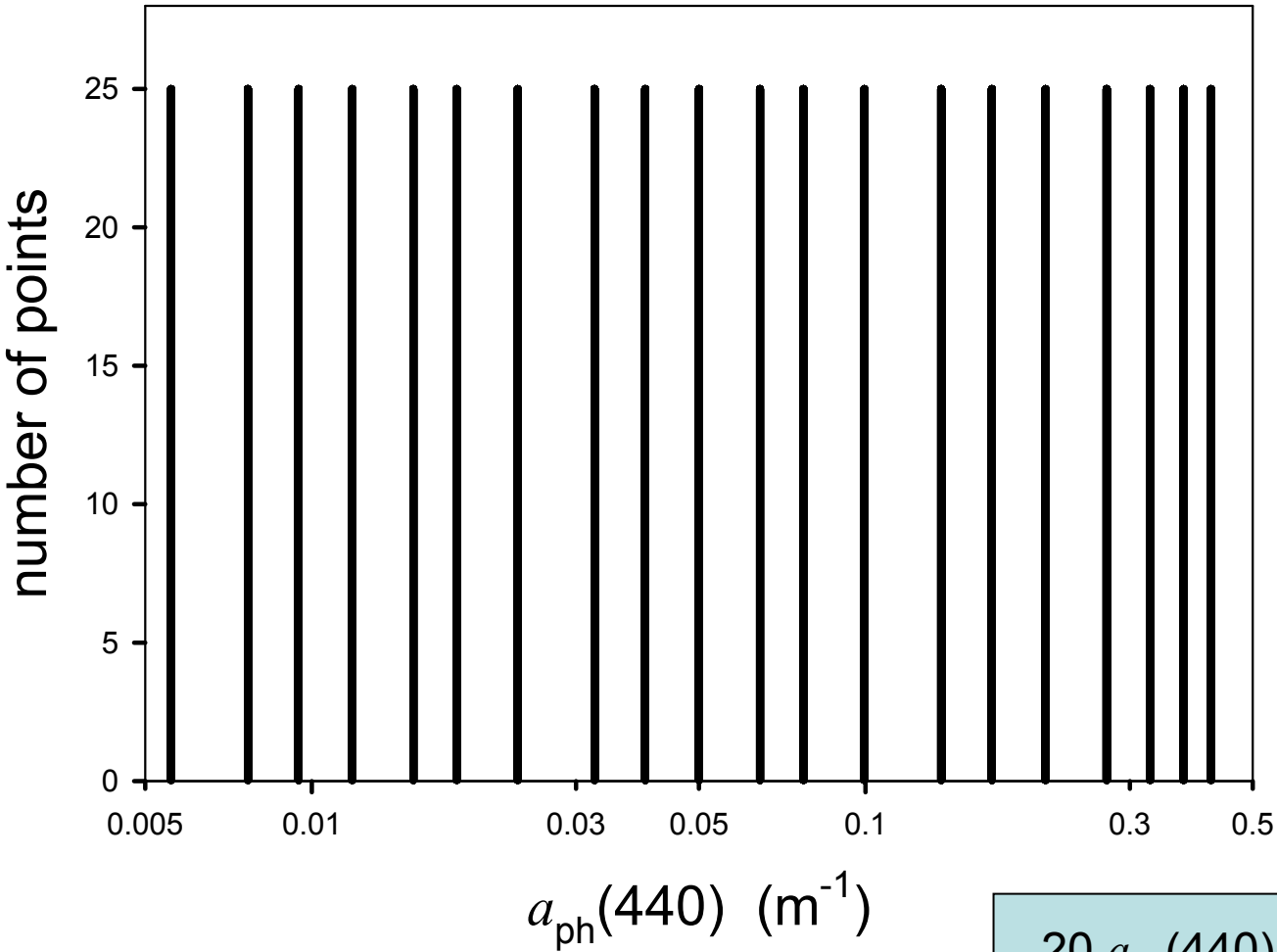
$$a_{dm}(\lambda) = a_{dm}(440)\exp(-S_{dm}(\lambda - 440))$$

$$a_{g}(\lambda) = a_{g}(440)\exp(-S_{g}(\lambda - 440))$$

variables

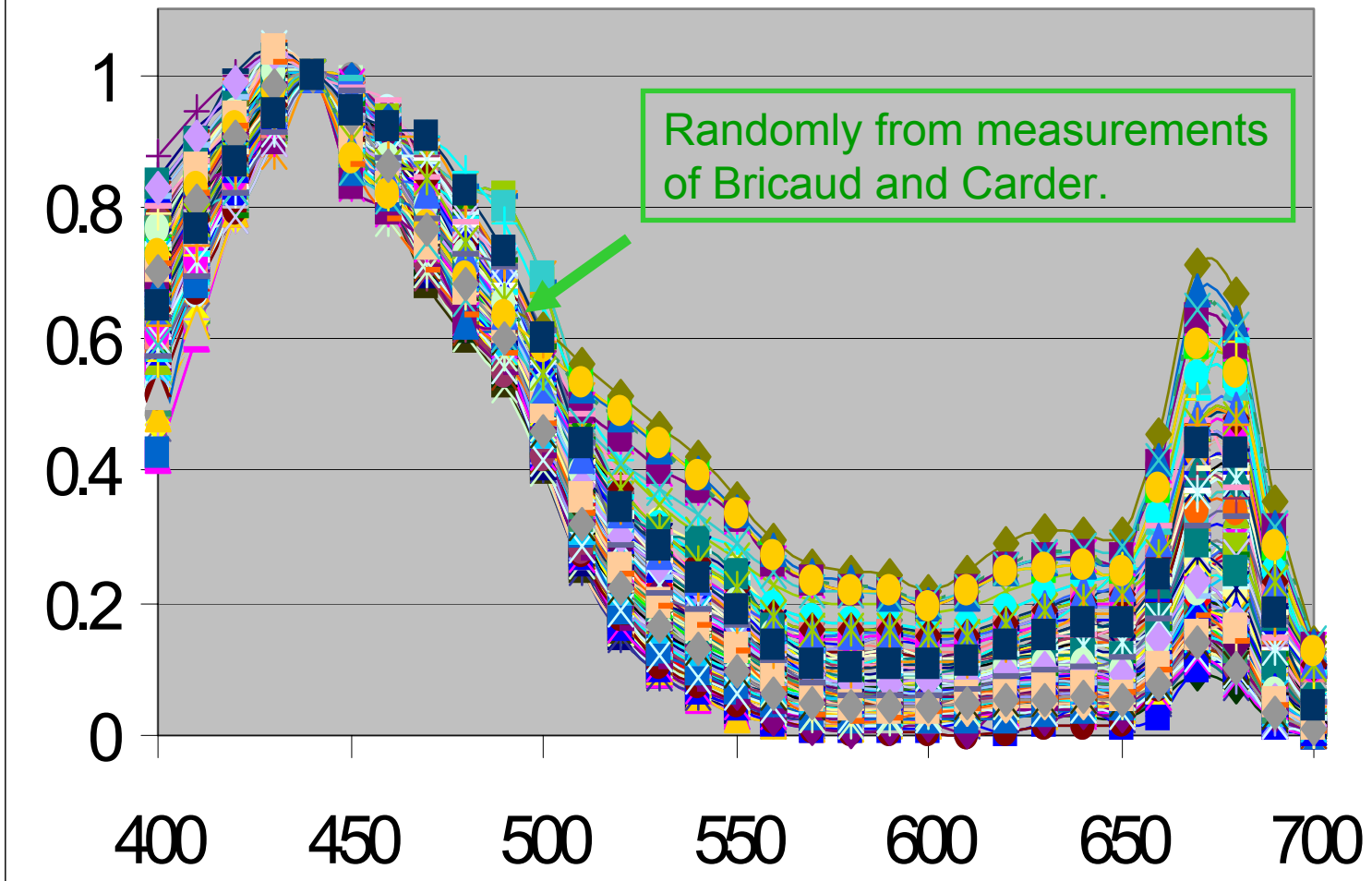
1. Characteristics continue:

$a_{ph}(440)$



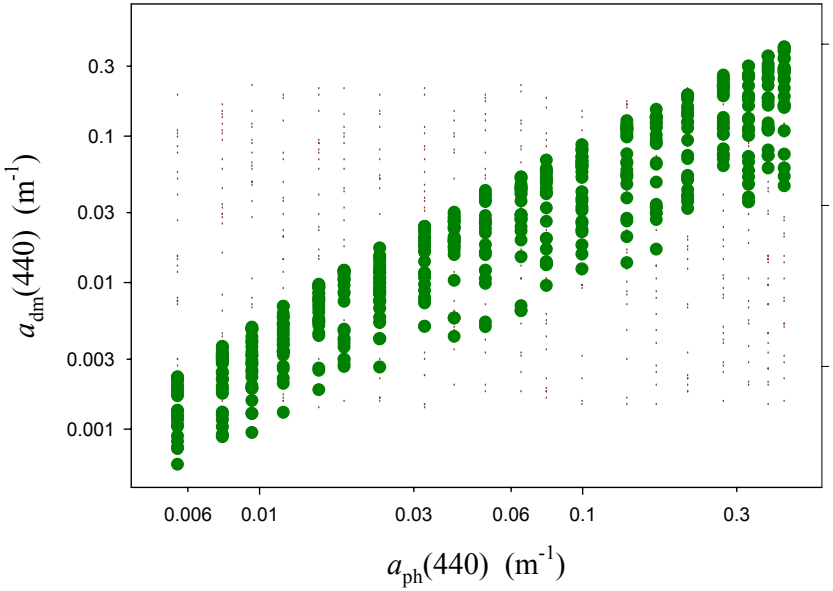
20 $a_{ph}(440)$ steps

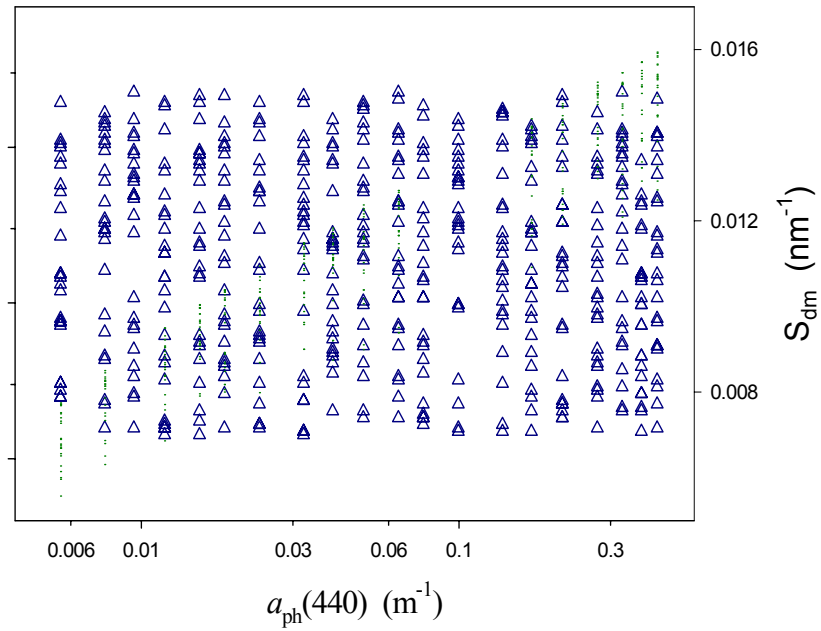
Examples of $a^{+}_{ph}(\lambda)$



1. Characteristics continue:

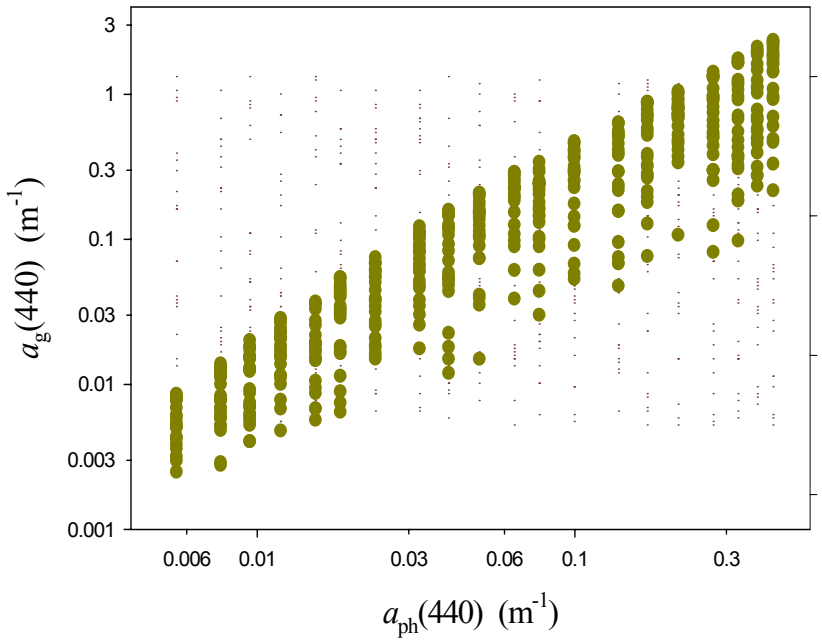
$a_{dm}(440)$ and S_{dm}

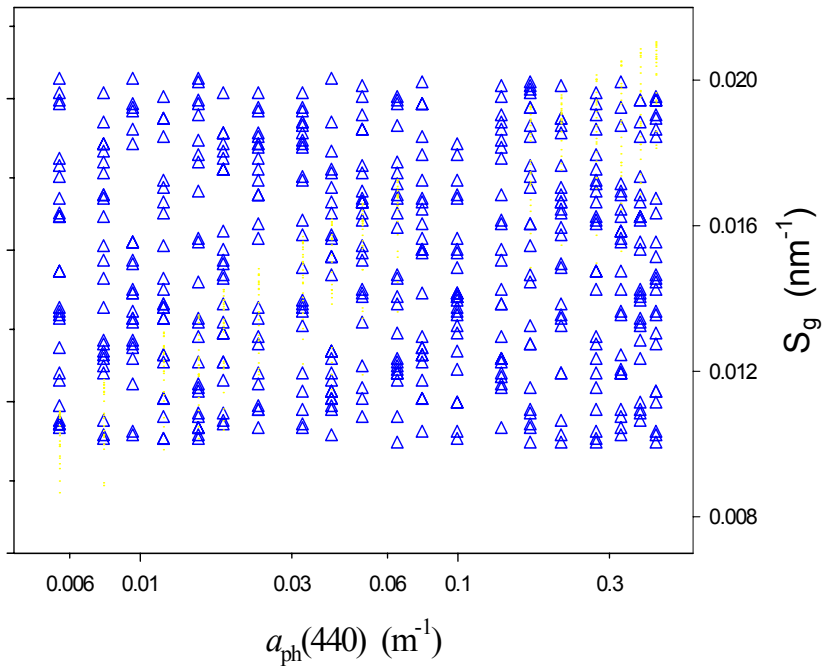




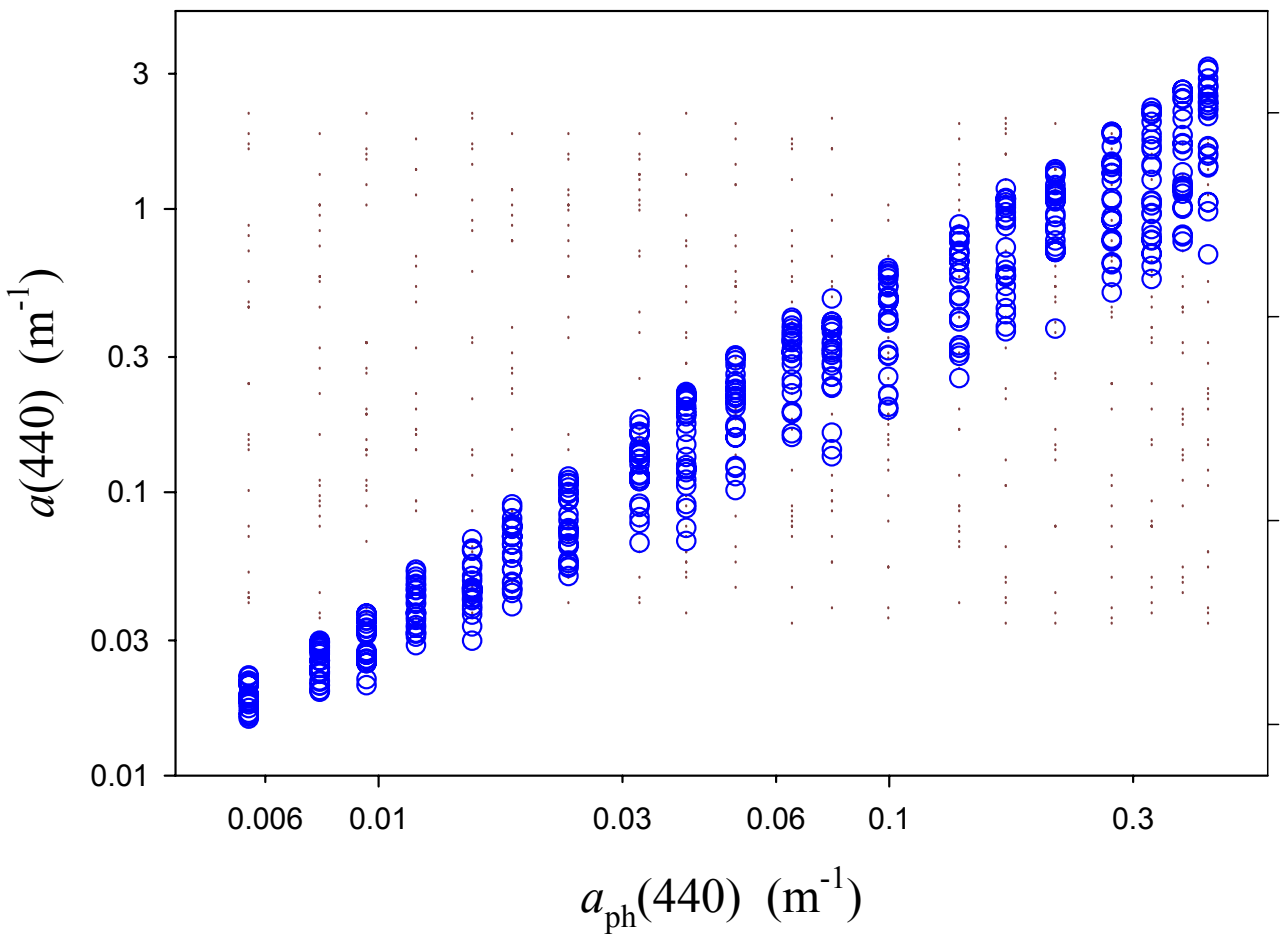
1. Characteristics continue:

$a_g(440)$ and S_g

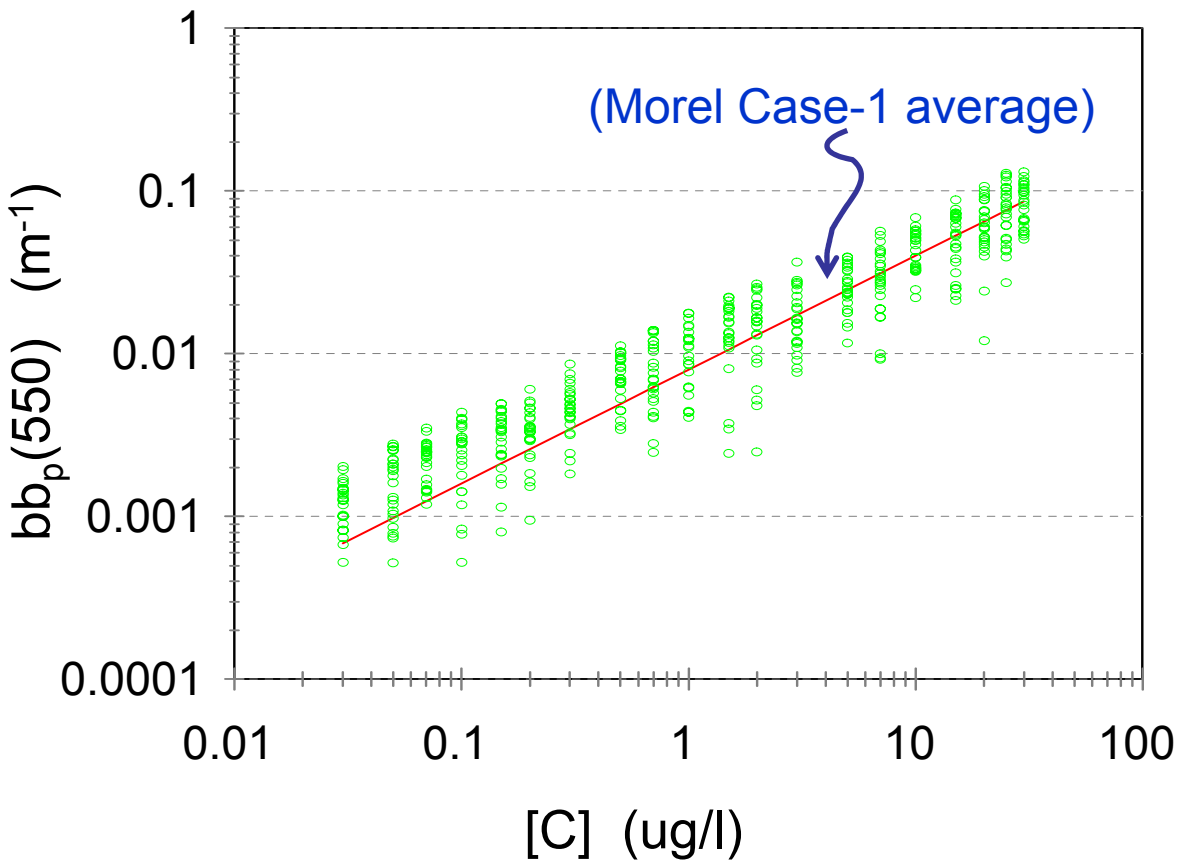




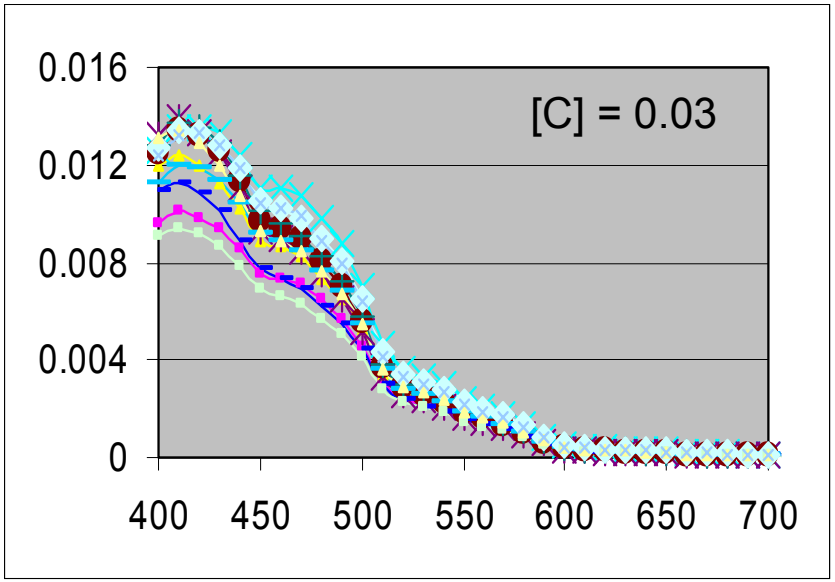
1. Characteristics continue:

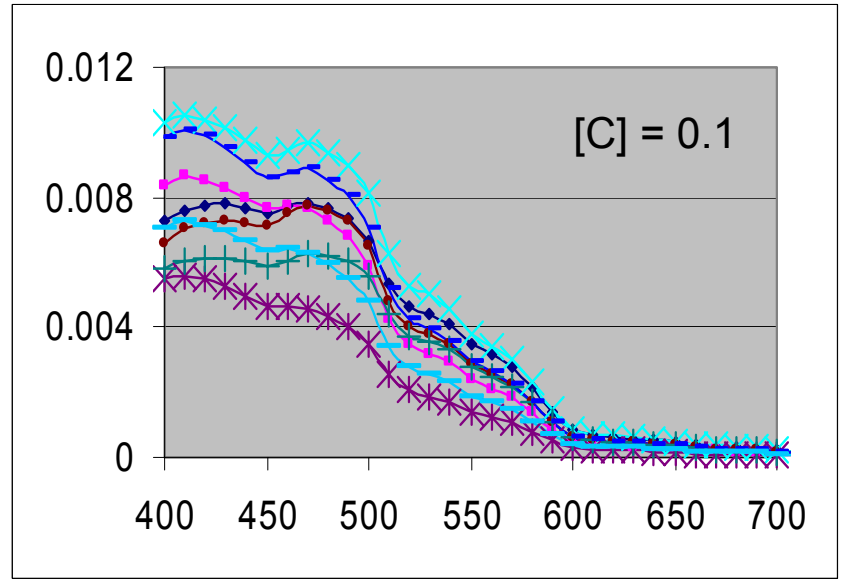


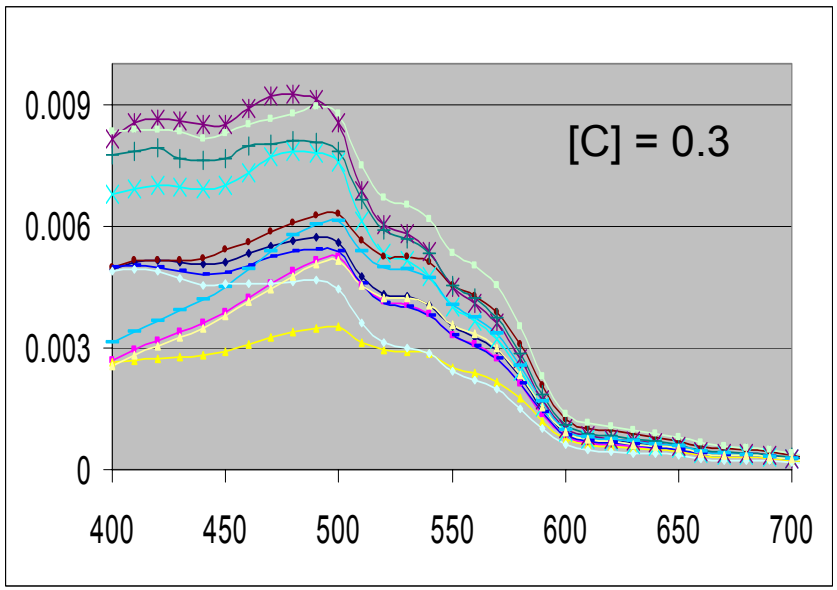
1. Characteristics continue:

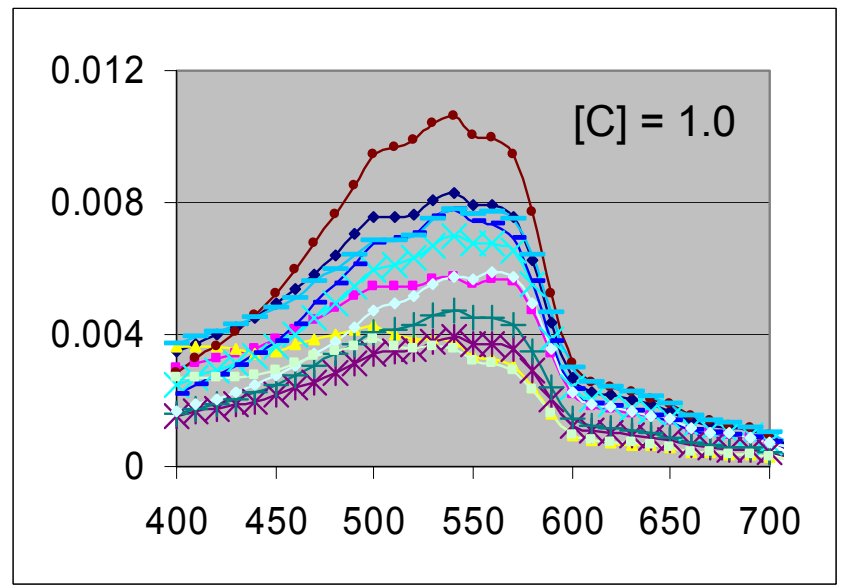


Examples of simulated $R_{rs}(\lambda)$









2. Preliminary results of some inversion algorithms

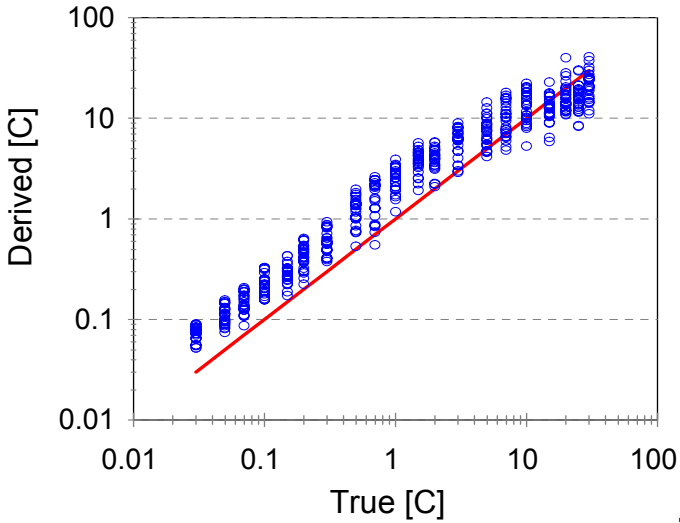
- A. Empirical algorithm
- B. Carder model-based algorithm
- C. Hoge/Lyon model-based algorithm
- D. Loisel model-based algorithm
- E. Lee model-based algorithm
- F. Maritorena model-based algorithm
- G. Lee model-based algorithm (optimization)
- H. Boss model-based algorithm
- I. Doerffer Neural-Net algorithm

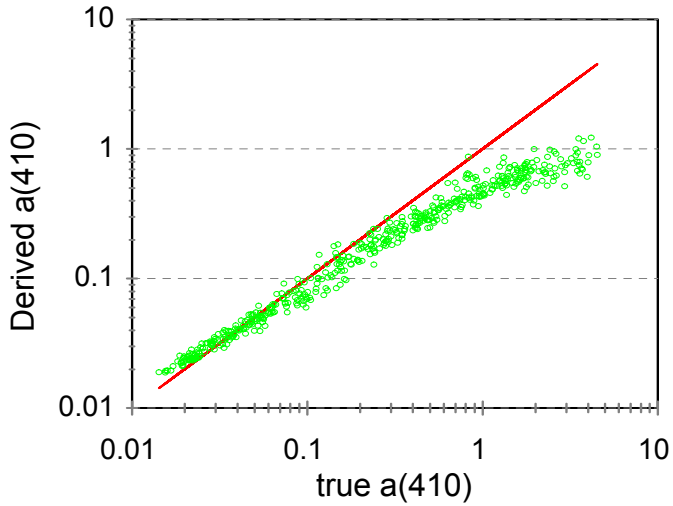
(NOT a fair comparison yet!)

A. Empirical algorithm [SeaWiFS & Morel/Maritorena 2001]

Approach: OC4v4→[C]→K→a

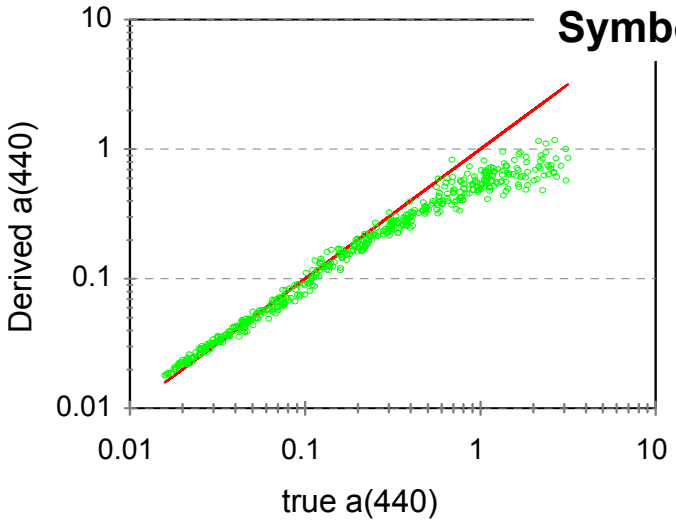
Input: Rrs(440, 490, 510, 555)

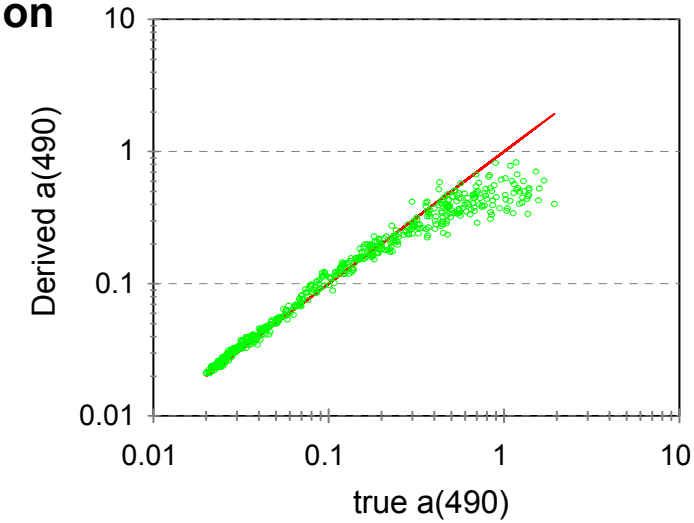




1:1

Symbol: inversion

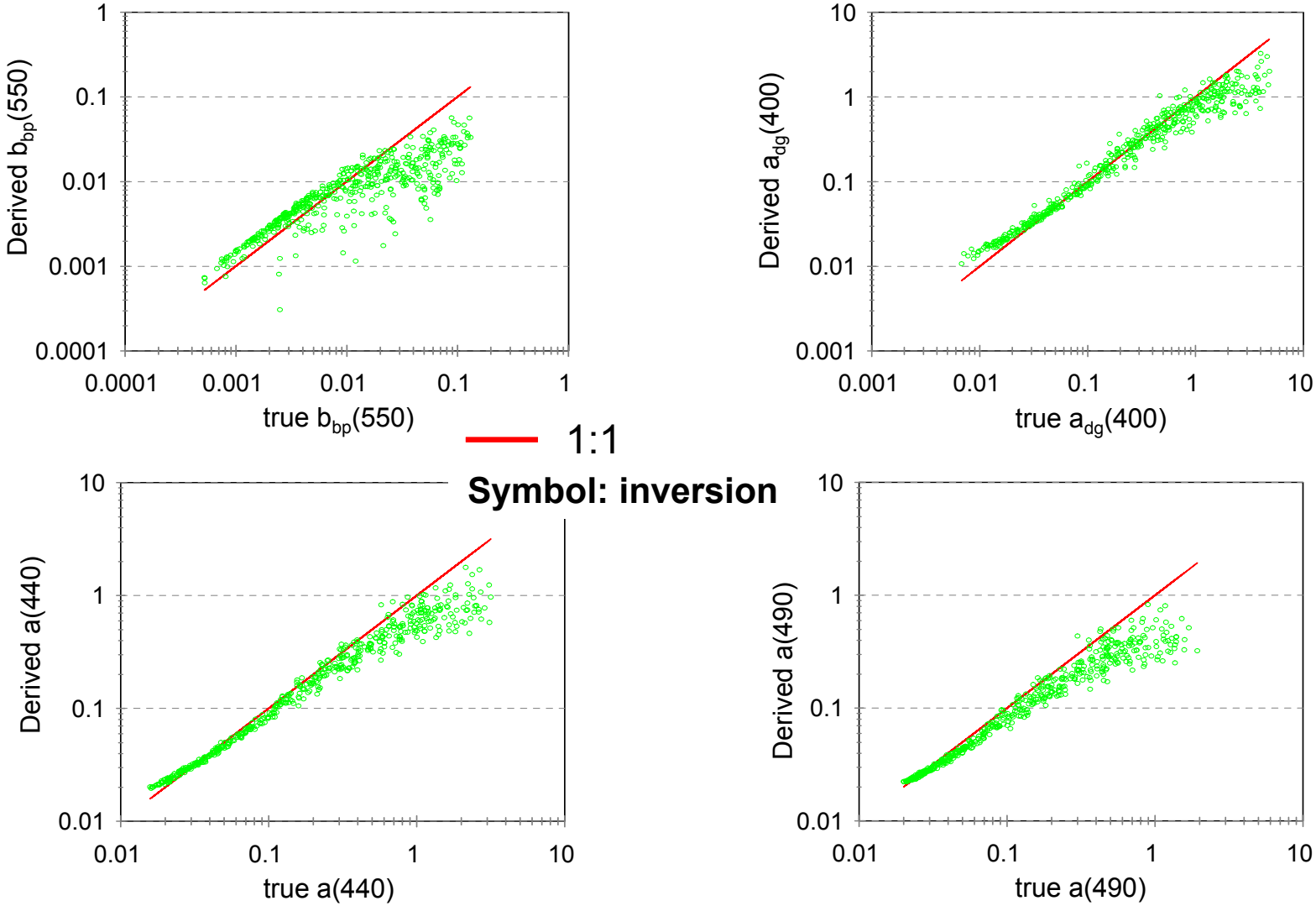




B. Carder [1999] model-based algorithm

Approach: Rrs → a&b_b

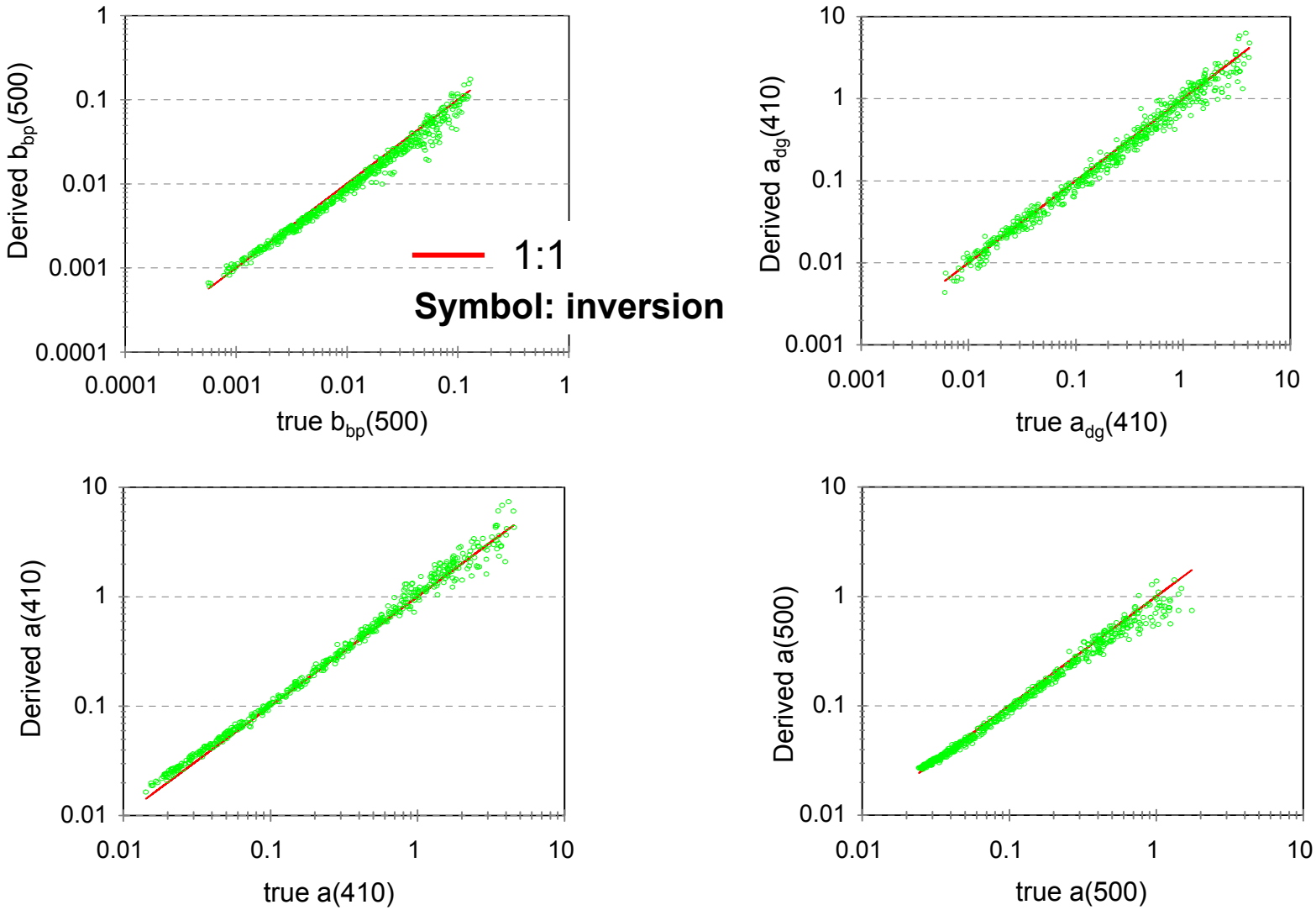
Input: Rrs(410, 440, 550)



C. Hoge/Lyon [1996] model-based algorithm

Approach: Rrs → a&b_b {LMI}

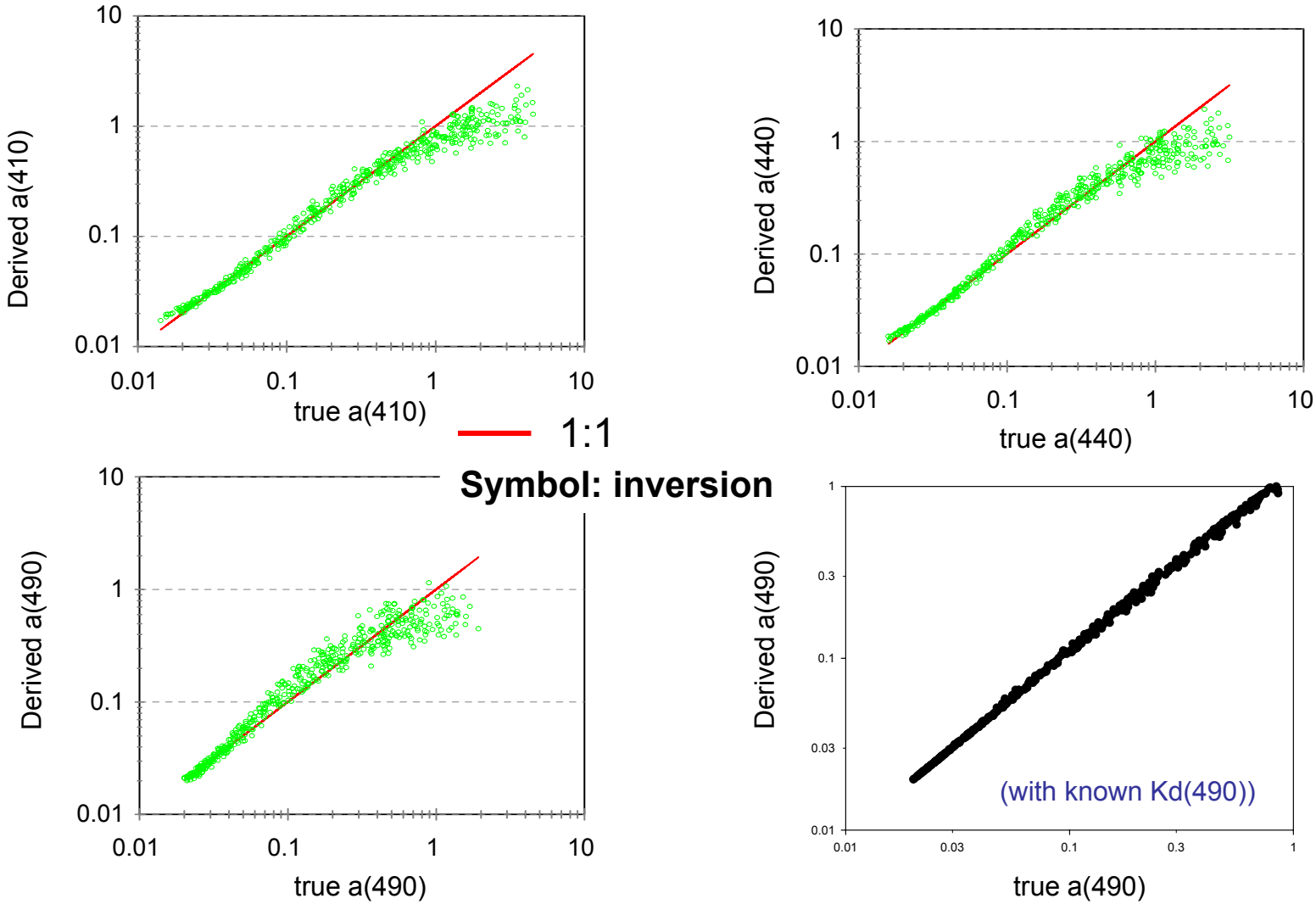
Input: Rrs(410, 500, 590)



D. Loisel [2001] model-based algorithm

Approach: Rrs→Kd→a&b_b

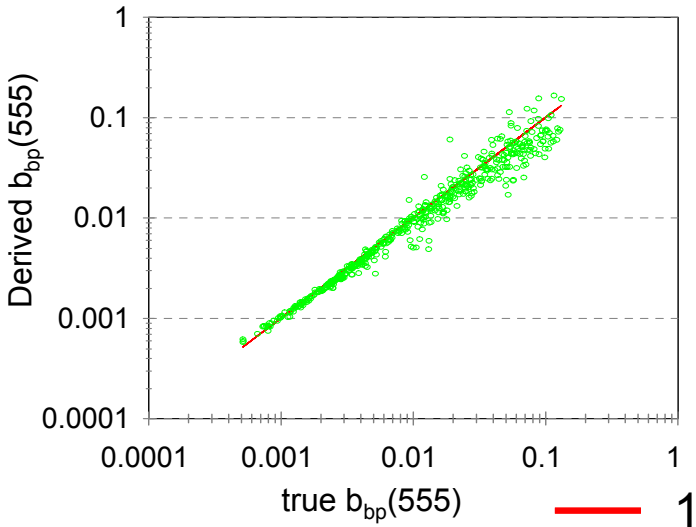
Input: Rrs(410, 440, 490, 555)

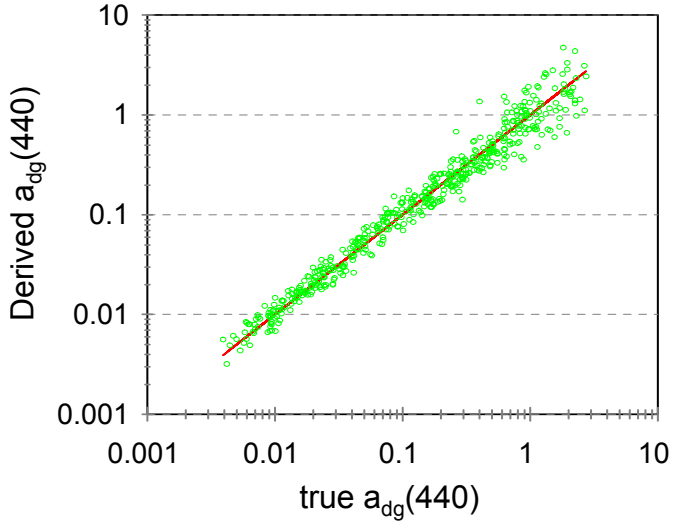


E. Lee [2002] model-based algorithm

Approach: Rrs→a&b_b {QAA}

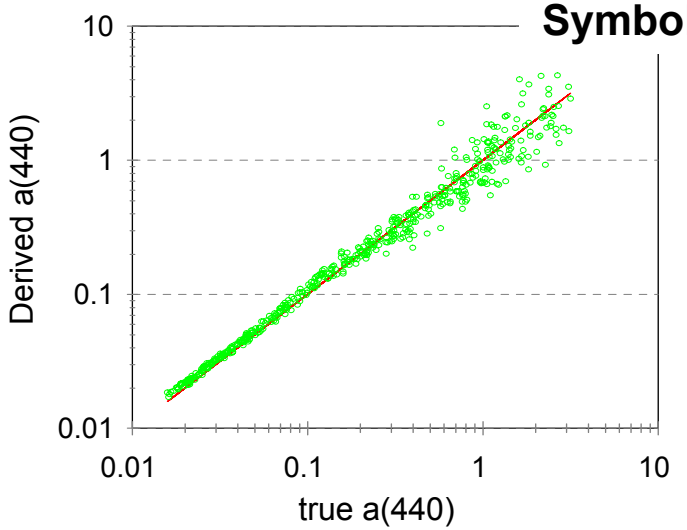
Input: Rrs(410, 440, 490, 510, 555)

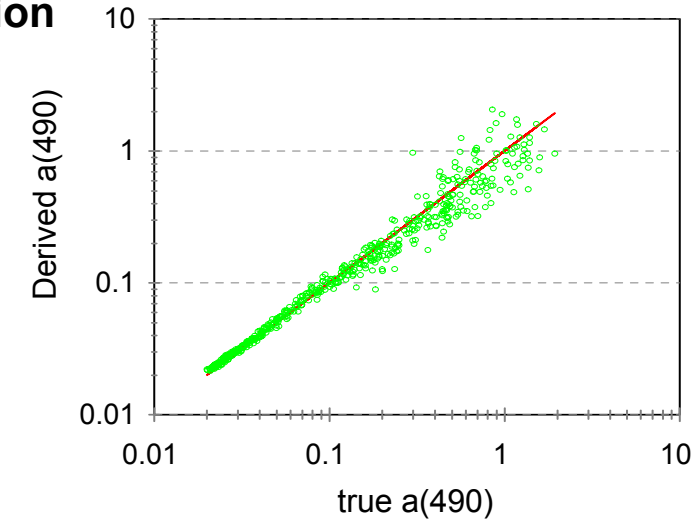




1:1

Symbol: inversion

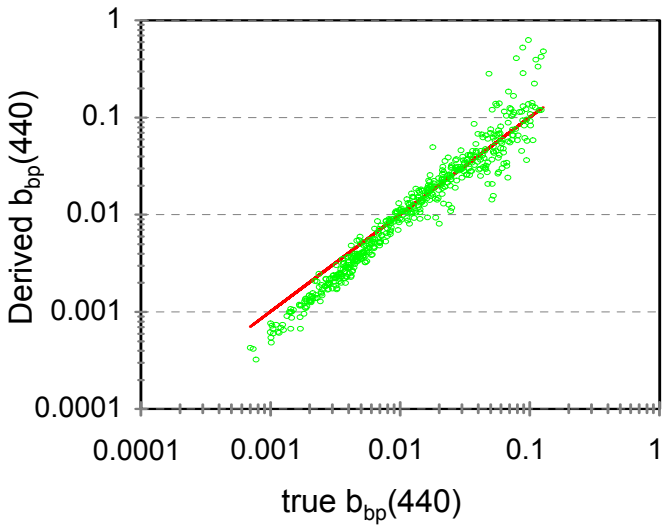


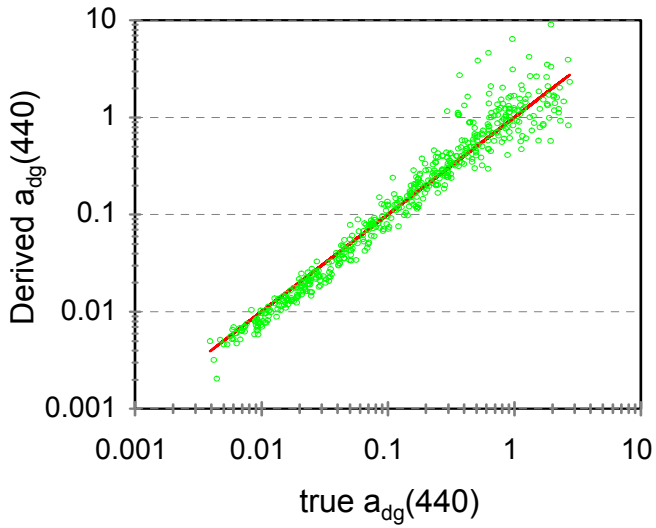


F. Maritorena [2002] model-based algorithm

Approach: Rrs→a&b_b {optimization}

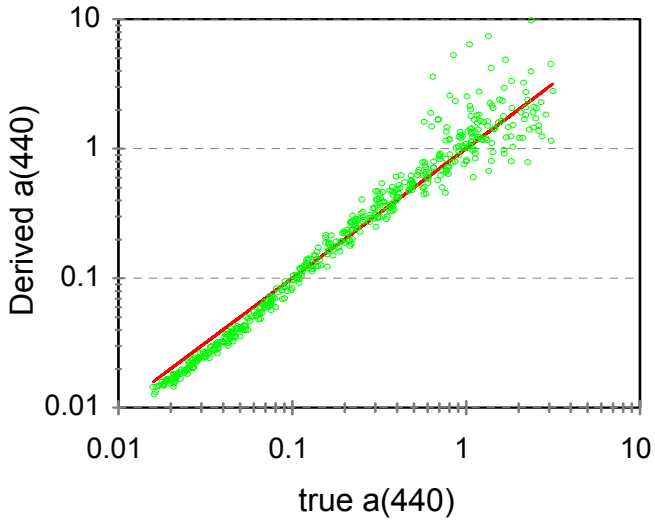
Input: Rrs(410, 440, 490, 510, 555)





1:1

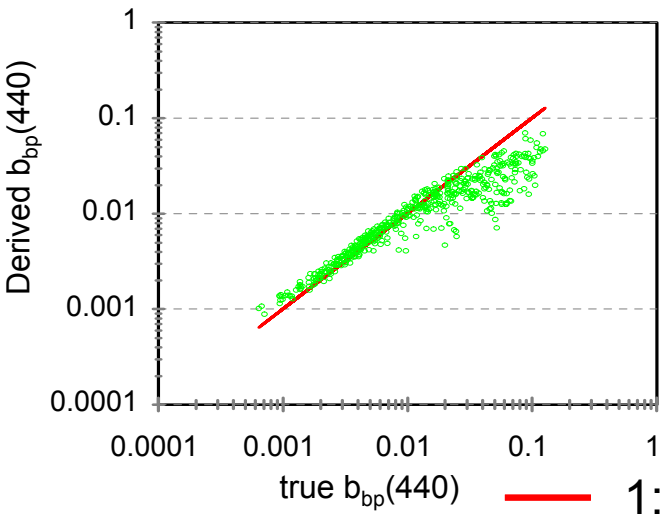
Symbol: inversion

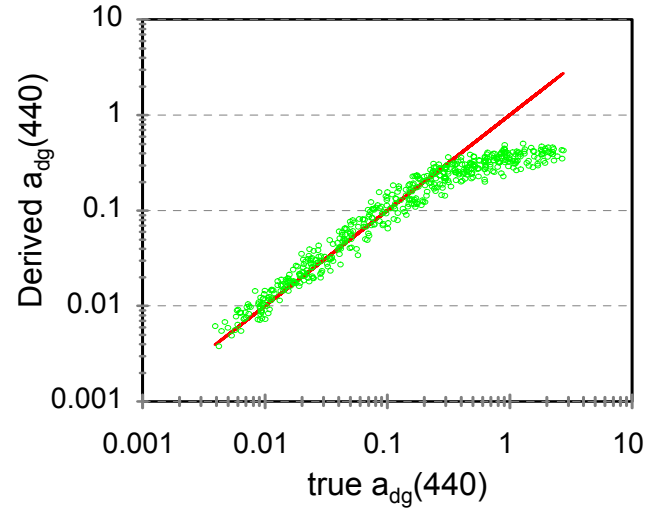


G. Lee [1999] model-based algorithm

Approach: Rrs→a&b_b {optimization}

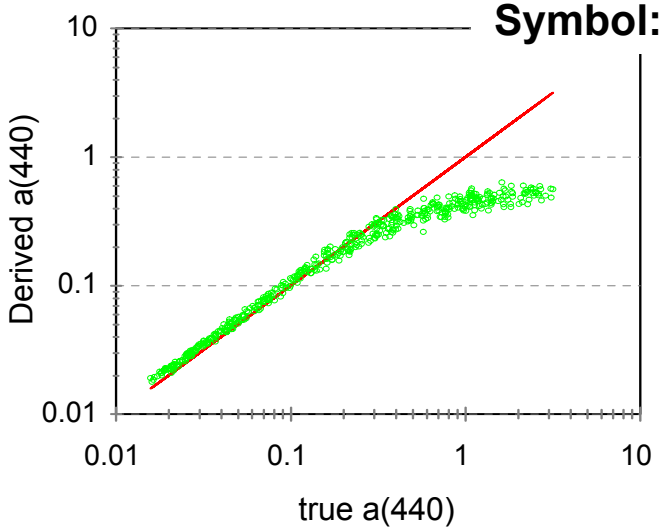
Input: Rrs(410, 440, 490, 510, 555)

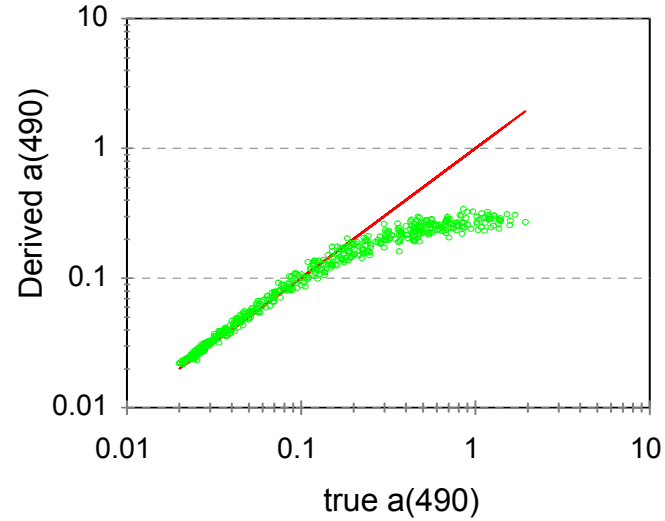




1:1

Symbol: inversion

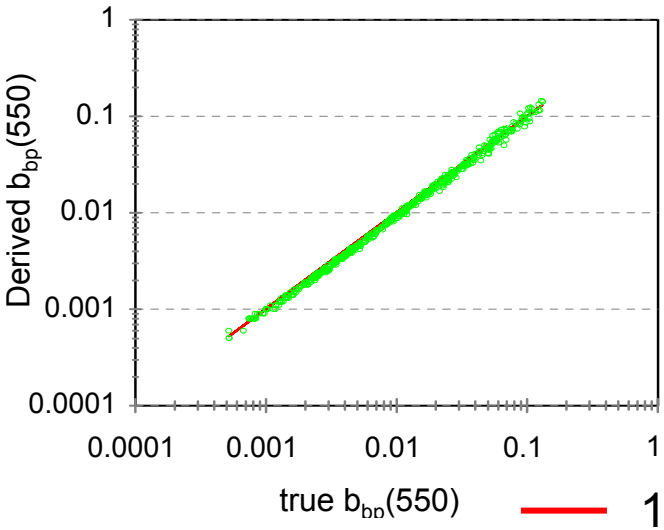


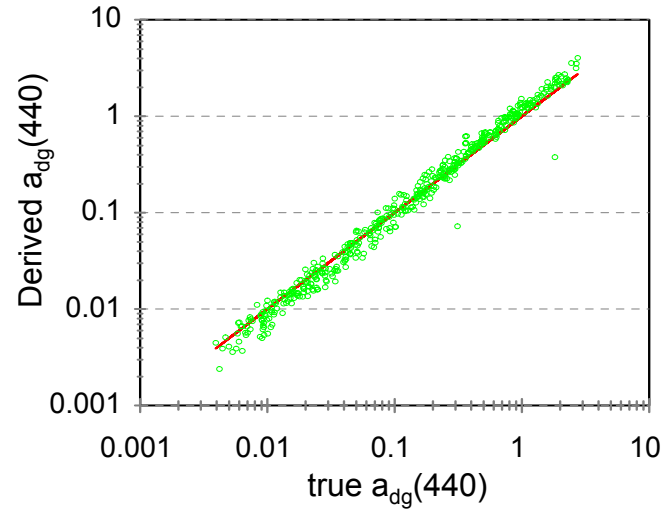


H. Boss [2004] model-based algorithm

Approach: ?

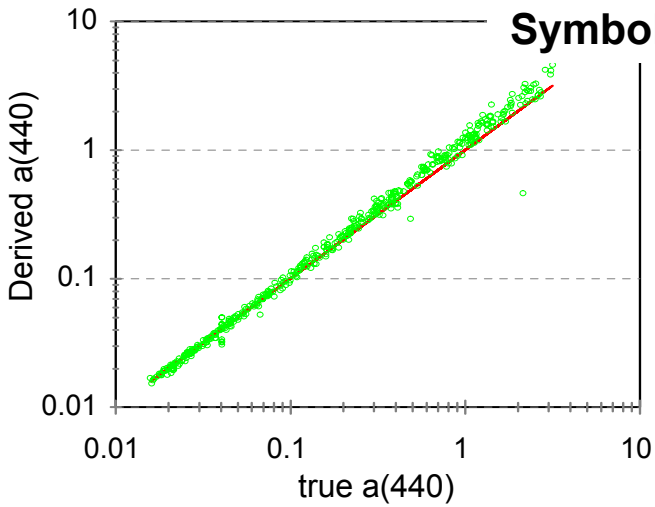
Input: Rrs(410:10:650)

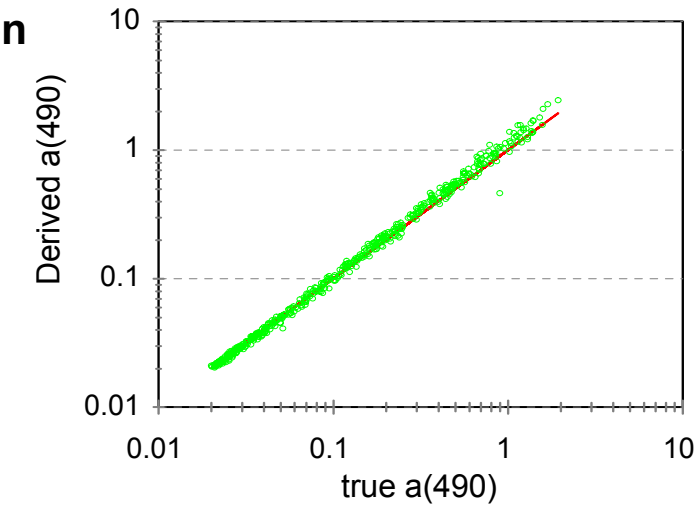




1:1

Symbol: inversion





I. Doerffer Neural-Net algorithm

3. Next:

a. Introduce “noises” into the current dataset, and run the algorithms again.
b. Meeting in Feb. to discuss what/how to compare results.
c. A workshop to present/discuss inversion results.
d. Prepare reports regarding algorithm performances.